

Bats, Birds, and Bighorns



For use with: Arizona Wildlife Views Television Show, 08-09 Season, Episode 2

Human-Environment Interactions; Habitat Restoration;
Outdoor Recreation

Time Frame: 2-3 hours **Grade:** 4-8

Overview:

This video focuses some of the management and education activities being used to help a number of animal species in Arizona. The first segment showcases the highly successful bighorn sheep translocations that have taken place for half a century in the state. Next, an exciting annual event centered around the yearly return of sandhill cranes is featured. Finally, it looks at the efforts of the Arizona Game and Fish Department and a landowner to provide suitable habitat for bats. Students will have the opportunity to develop public safety and educational signs.

Essential Questions

- How do biologists manage wildlife populations?
- How can human activities benefit and harm wildlife?
- What techniques do writers use to engage and persuade their audience?

Objectives

- List two methods biologists use to help wildlife populations.
- Describe how technology has improved the success of large mammal relocations.
- Develop a sign designed to achieve a specific objective of public safety or education.

Arizona Department of Education Standards

Science

4 th grade	5 th grade	6 th grade	7 th grade	8 th grade
S1-C1-PO2	S3-C2-PO2	S2-C1-PO4	S2-C1-PO4	S2-C1-PO4
S3-C1-PO1		S3-C2-PO4	S3-C1-PO1	S3-C1-PO1
S4-C3-PO4			S3-C1-PO2	
			S3-C2-PO4	

Writing

4 th grade	5 th grade	6 th grade	7 th grade	8 th grade
S2-C3-PO1	S2-C3-PO1	S2-C3-PO1	S2-C3-PO1	S2-C3-PO1
S2-C4-PO1	S2-C3-PO3	S2-C3-PO3	S2-C3-PO3	S2-C3-PO3
S3-C4-PO1	S2-C4-PO1	S2-C3-PO4	S2-C3-PO4	S2-C3-PO4
	S3-C4-PO1	S2-C4-PO1	S2-C4-PO1	S2-C4-PO1
		S2-C4-PO2	S2-C4-PO2	S2-C4-PO2
		S3-C4-PO1	S3-C4-PO1	S3-C4-PO1

Workplace Skills

4 th – 8 th grades
5WP-E3-PO1

Technology

4 th – 8 th grades
3T-E1-PO2



Materials and Resources

- Copy of Arizona Wildlife Views episode
- Computer

**Teacher Preparation**

- Acquire a copy of the television show. You can check local listings to determine when it will air and record it directly. You may also check the Department's web site to see if a copy can be downloaded or ordered.
- Write the vocabulary words and questions on the board.

Background Information:

This is not a lesson plan in the traditional sense. It does not provide step-by-step directions for completing an activity. Instead, it provides information to help you use an episode of the *Arizona Wildlife Views* television program in your classroom. It contains five suggested activities along with extensions and modifications. The first activity focuses on vocabulary. We have provided and defined some of the words used in the video. You are encouraged to use any appropriate strategies to introduce these to your students. Then, there is a series of comprehension questions that students can answer while watching the video. Answers (directly from the video) are provided in italics. Next, the critical thinking questions build on the major concepts introduced in the video. Students need to put a little bit more thought into these questions. Some reasonable answers are provided in italics. However, teachers should be cautious and realize that students may provide additional answers that can be supported with evidence. Then, there is an in-depth activity. This activity allows students to evaluate and synthesize one or more of the concepts from the video, perhaps applying it to a new context or utilizing additional skills. The last activity allows students to explore wildlife-related careers in a little more detail.

This episode originally aired on PBS (KAET Channel 8) in Phoenix on January 25, 2009. It may also be shown on regional PBS stations or other channels. For additional viewing information or download options, please visit <http://www.azgfd.gov/focuswild>.

Additional information about the programs featured in this episode can be found at:

- ✓ Desert Bighorn Sheep:
http://www.azgfd.gov/h_f/game_bighorn.shtml
- ✓ Wings Over Willcox: <http://www.wingsoverwillcox.com/>
- ✓ International Crane Foundation:
<http://www.savingcranes.org/>
- ✓ Bat Conservation and Management:
http://www.azgfd.gov/w_c/bat_conservation.shtml
- ✓ Living with Bats:
http://www.azgfd.gov/w_c/urban_bats.shtml
- ✓ Bat of Arizona Poster and Activities:
http://www.azgfd.gov/i_e/ee/resources/posters/bats_index.shtml

Relevant Vocabulary:

- Culvert – a pipe that usually carries water under a road
- Niche – a cavity or small space in a wall
- Roost – a place where birds, bats, and some other animals sleep
- Temperature Regime – a set of temperatures (i.e., highs and lows) required for a particular animal or situation
- Transplant/Translocate – to move animals from one location to another

Comprehension Questions:

1. How many years has the Arizona Game and Fish Department been translocating bighorn sheep? *Answer: 50 years, as of this video. It began in 1957.*
2. How many bighorn sheep can now be found in Arizona? *Answer: About 6,000.*
3. Why are chases during the bighorn sheep captures limited to five minutes? *Answer: To prevent the animal from overheating.*
4. How many sandhill cranes can potentially be seen during the Wings Over Willcox festival? *Answer: Over 20,000.*
5. How many species of cranes are found in the world? *Answer: 15.*
6. According to the video, what is the fastest growing sport? *Answer: Birdwatching.*
7. What is the most critical component of tunnels that bats roost in? *Answer: Air flow.*
8. What is the purpose of the domed structures in the artificial bat roosts? *Answer: To trap the hot air to provide a better area for maternity roosts.*
9. How many species of bats are found in Arizona? How many are endangered? *Answer: 28 total species found with one that is endangered.*

Critical Thinking Questions:

1. How has technology improved the bighorn sheep captures and relocations? *Answer: In the past, it was much more difficult to capture the bighorn sheep. Now, using helicopters, they can be tracked to the most rugged country. Then, by using different types of net guns, it has been easier to trap them. There is much less man-power and time needed. The captures are much more efficient.*
2. What is meant by the term “living fossil”? *Answer: Basically, this means that the animal alive today has changed very little*

over the course of its existence. That means the individuals we see today would look very similar to those that lived millions of years ago. Examples of animals that are considered “living fossils” are cranes, crocodiles, and horseshoe crabs.

3. If most of the bat populations in Arizona are stable, why are wildlife biologists so concerned about protecting them? *Answer: Although many of the populations are stable right now, there is a fear that in the very near future, those populations will start to decline. The main reason is that much of the suitable bat habitat is being destroyed or blocked off (as is the case with many of the old mines in the state). This is making fewer and fewer roosts available for the animals. If this continues, the number of bats will start to drop, and it might happen quickly.*

In-Depth Activity: Education Advertising

An important habitat for bats are old, abandoned mine shafts. Unfortunately, these shafts can be dangerous for humans. If they are not properly sealed off, a hiker or other recreationist may accidentally fall into them.

Pretend you are a member of an advertising company. The state of Arizona has decided that for safety reasons, they will be sealing off a number of these old mine shafts. However, they will be working with the Arizona Game and Fish Department to make sure that the seals keep the shafts usable by bats while still being safe for humans, perhaps through specially designed gates or fences.

The state has approached your advertising company to develop signs that can be posted around the shaft entrances. They want the signs to fulfill the following purposes:

- Indicate that the shaft and the gate are property of the state of Arizona.
- Warn the public to be cautious around the abandoned mine shaft.
- Provide basic safety information about bats, specifically information about rabies and what to do if you see a bat on the ground.
- Educate the public about the importance of bats to the environment.

Think about the techniques you should use. What types of words and pictures would be most effective to achieve each of the desired objectives? Can it be done with one sign or will a series of signs be necessary?

Use a computer to develop your sign (or signs). If necessary, use the Internet to research and locate pictures.

Career Focus

This video provided a brief look at one or more careers related to wildlife management and conservation. These careers are listed below along with the segment of the video in which they appeared.

Watch the segments related to the specific career. Write down notes about how this career helps wildlife. Use the Internet to research additional information about this career, including specific job duties, education and training required, potential salaries, and future outlook.

Careers featured in this episode:

- Construction – Heavy Machine Operator (Segment 3)
- Helicopter Pilot (Segment 1)
- Veterinarian (Segment 1)
- Wildlife Biologist (Segments 1 and 3)



Differentiated Instruction:

Extensions:

- **Mathematics:** Over the past 50 years, Arizona has performed 100 bighorn sheep transplants. This has resulted in about 1,800 sheep being moved from one location to another. On average, how many sheep are moved per year? Per transplant? Over the past 20 years, about \$5 million has been raised through a special fund for this program. Assume this is the only funding received to transplant sheep and all of the funding is used for this purpose. On average, how much money is spent on each transplant? On each sheep?
- **Geography:** In early March, the sandhill cranes will start to migrate out of Arizona to head back to their nesting locations. One of their stops along the way is the Rowe Sanctuary near Kearney, Nebraska. Locate Willcox, Arizona and Kearney, Nebraska on a map. How far is it between these two cities? Pretend you wanted to see the birds at both locations. Plan a route that will get you there the fastest. How many miles would you drive? How long would it take you?
- **Life Skills:** Try building your own bat house. Use the Internet to research different designs. Acquire the materials and build the one of your choice. Hang it in a suitable location at your school or house.

Modifications:

- Create a student handout with the vocabulary words and questions already provided.
- Provide students with the definitions and have them match them to the appropriate vocabulary words.
- Provide fill-in-the-blank responses for the Comprehension Questions, allowing students to listen for appropriate words to complete the sentences.
- Download the video transcripts (if available) and provide to students.



Reflection:

Use the space below to reflect on the success of the lesson. What worked? What didn't? These notes can be used to help the next time you teach the lesson. In addition, the Department would appreciate any feedback. Please visit <http://www.azgfd.gov/focuswild> and submit a lesson evaluation.